IN THE CLAIMS:

1. (Original) A particulate sampler for use in analyzing particulate matter in exhaust gas from an emissions source, said sampler comprising:

a transfer tube assembly including a probe at least partially defining a sample exhaust gas passageway having a first end portion with an opening for receiving the exhaust gas from the emissions source and extending to a second end portion, said transfer tube assembly includes an outer tube surrounding at least a portion of said probe to define an insulator cavity to maintain a temperature of the exhaust gas in said sample exhaust gas passageway;

a mixer receiving said second end portion, said mixer including a dilution gas passageway for carrying a dilution gas with said dilution gas passageway in communication with said sample exhaust gas passageway for introducing dilution gas to the exhaust gas; and

a tunnel connected to said mixer and including a gas mixing passageway extending a length for homogeneously mixing the gases together with a mixing orifice arranged between said second end portion and said gas mixing passageway, and the exhaust gas and the dilution gas commingling prior to flowing through said orifice to said gas mixing passageway.

2. (Original) The sampler according to claim 1, wherein said tunnel includes a flange for connection to said mixer with said orifice provided by said flange.

3. (Original) The sampler according to claim 1, wherein said gas mixing passageway has a diffusor tapering toward said orifice to ensure that the particulate matter mixes with the gases along said length of said gas mixing passageway without collecting in a recirculating flow area.

4. (Original) The sampler according to claim 1, wherein the mixer includes an end cap arranged about the second end portion removably secured to said transfer tube assembly and said mixer.

5. (Original) The sampler according to claim 1, wherein said tunnel and mixer are removably secured to one another .

6. (Currently Amended) The sampler according to claim 1, wherein ~~said transfer tube assembly includes an outer tube with~~ said outer tube spaced from said at least a portion of said probe to define ~~an~~ said insulator cavity ~~to maintain a temperature of the exhaust gas in said sample exhaust gas passageway~~.

7. (Original) The sampler according to claim 1, wherein said probe is approximately ¼ inch in diameter.

8. (Original) A particulate sampler for use in analyzing particulate matter in exhaust gas from an emissions source, said sampler comprising:

a transfer tube assembly including a probe at least partially defining a sample exhaust gas passageway having a first end portion with an opening for receiving the exhaust gas from the emissions source and extending to a second end portion, said transfer tube assembly includes an outer tube surrounding at least a portion of said probe to define an insulator cavity to maintain a temperature of the exhaust gas in said sample exhaust gas passageway; and

a mixer receiving said second end portion and having a portion arranged concentrically thereabout forming a dilution gas chamber, said mixer including a dilution gas passageway arranged between said first and second end portions for carrying a dilution gas to said dilution gas chamber.

9. (Original) The sampler according to claim 8, wherein said second end portion includes a terminal end with said gases commingling at said terminal end.

10. (Original) The sampler according to claim 8, wherein mixer has a diffusor tapering toward said second end portion to ensure that the particulate matter mixes with the gases without collecting in a recirculating flow area.

11. (Currently Amended) The sampler according to claim 8, wherein ~~said transfer tube assembly includes an outer tube with~~ said outer tube spaced from said at least a portion of said probe to define ~~an~~ said insulator cavity ~~to maintain a temperature of the exhaust gas in said sample exhaust gas passageway~~.

12. (Original) The sampler according to claim 8, wherein said probe is approximately ¼ inch in diameter.

13. (Original) The sampler according to claim 8, wherein said probe is removably secured to an end of said outer tube by a threaded fastener for permitting disassembly of said transfer tube assembly for cleaning.

14. (Currently Amended) A particulate sampler for use in analyzing particulate matter in exhaust gas from an emissions source, said sampler comprising:

a transfer tube assembly including a probe at least partially defining a sample exhaust gas passageway having a first end portion with an opening for receiving the exhaust gas from the emissions source and extending to a second end portion; and

a mixer receiving said second end portion and having a portion forming a dilution gas chamber, said mixer including a dilution gas passageway defined by spaced apart first and second feed tubes for carrying a dilution gas to said dilution gas chamber, ~~said feed tubes having outlets arranged between the first and second end portions~~.

15. (Currently Amended) The sampler according to claim 1, wherein said mixer includes a portion forming a dilution gas chamber, ~~said dilution gas chamber~~ surrounding at least a portion of said outer tube ~~radially outwardly of said outer tube and between said first and second end portions~~, said dilution gas passageway defined by at least one feed tube for carrying a dilution gas to said dilution gas chamber.

16. (Currently Amended) The sampler according to claim 8, wherein said mixer includes a portion forming a dilution gas chamber, said dilution gas chamber surrounding at least a portion of said outer tube radially outwardly of said outer tube and between said first and second end portions, said dilution gas passageway defined by at least one feed tube for carrying a dilution gas to said dilution gas chamber.

17. (New) The sampler according to claim 14, wherein said second end includes a terminal end from which undiluted exhaust gas exits, the dilution gas exiting said outlets upstream from said terminal end.

18. (New) The sampler according to claim 1, wherein a temperature sensor is arranged in close proximity to said probe, said sensor determining whether the sample exhaust gas is maintained at said temperature by said insulator cavity.

19. (New) The sampler according to claim 8, wherein a temperature sensor is arranged in close proximity to said probe, said sensor determining whether the sample exhaust gas is maintained at said temperature by said insulator cavity.

20. (New) The sampler according to claim 14, wherein a temperature sensor is arranged in close proximity to said probe, said sensor determining whether the sample exhaust gas is maintained at said temperature by said insulator cavity.